Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1.   (Currently amended) A method for controlling on/off states of an engine in a hybrid electric vehicle powertrain, the method comprising the steps of:
generating a plurality of request state variables based on a comparison of vehicle operating conditions and requirements, each variable indicating an active or inactive status of a plurality of engine requests;
prioritizing the active request state variables according to a predetermined schedule;
selecting at least two active request state variables of higher priority than other request state variables in the plurality of request state variables;
combining the at least two request state variables to form a combined request state variable that contains active requests in the at least two request state variables;
simplifying the combined request state variable to eliminate any redundant requests and to resolve any conflicting requests;
providing a final request state variable; and
evaluating the final request state variable to determine whether a change in engine state is desirable.

2.   (Currently amended) A method of controlling the on/off state of an engine in a hybrid electric vehicle powertrain comprising the following steps:
generating a plurality of request state variables based on a comparison of vehicle operating conditions and requirements, each variable indicating the active or inactive status of each of a plurality of engine requests, the value of

each request state variable being constrained to a set of
fundamental request states;

  <u>prioritizing the active request state variables
according to a predetermined schedule;</u>

  <u>selecting at least two active request state
variables of higher priority than other request state
variables in the plurality of request state variables;</u>

  combining at least two request state variables to
form a combined request state variable that contains active
requests in the at least two request state variables;

  simplifying the combined request state variable to
eliminate any redundant requests and to resolve any
conflicting requests;

  providing a final request state variable; and

  evaluating the final request state variable to
determine whether a change in engine state is desirable.

  3.   (Original) The method of Claim 2 wherein the
step of combining joins two or more request states through a
bitwise OR operation.

  4.   (Original) The method of Claim 3 wherein the
step of simplifying includes an arbitration operation that
follows the requests according to a predetermined priority.

  5.   (Original) The method of Claim 2 wherein said
engine requests are grouped in hierarchical levels through the
combining and simplifying steps.

  6.   (Original) The method defined in Claim 2
wherein the step of evaluating the final request state
variable includes the step of:
transitioning a state machine from an engine off state to an
engine on state in accordance with the following expression:

$$\left(fpu + pu \circ \overline{ipu}\right) \circ \overline{fpd}$$,

where fpu, pu, ipu and fpd are engine request variables identifying the active or inactive status of engine requests.

7. (Original) The method of Claim 2 wherein each fundamental request state comprises a 6 bit binary word, each bit identifying whether an engine request state is active or inactive.

8. (Original) The method defined in Claim 2 wherein the step of evaluating the final request state variable includes the step of:
transitioning a state machine from an engine on state to an engine off state in accordance with the following expression:

$$fpd + pd \circ \overline{fpu} \circ \overline{ipd} \circ \overline{pu}$$,

where fpd, pd, fpu, ipd, and pu are engine request variables identifying the active or inactive status of engine requests.

9. (Original) The method defined in Claim 2 wherein the step of evaluating the final request state variable includes the steps of:
transitioning a state machine from an engine on state to an engine off state in accordance with the following expression:

$$fpd + pd \circ \overline{fpu} \circ \overline{ipd} \circ \overline{pu}$$

and otherwise maintaining the state machine in an engine on state; and

transitioning said state machine from an engine off state to an engine on state in accordance with the following expression:

$$\left(fpu + pu \circ \overline{ipu} \right) \circ \overline{fpd}$$

,

and otherwise maintaining the state machine in an engine off state;

where fpd, pd, fpu, ipd, pu, and ipu are engine request variables identifying the active or inactive status of engine requests.

10.   (Original)   The method of Claim 8 wherein each fundamental request state comprises a 6 bit binary word, each bit identifying whether an engine request state is active or inactive.

11.   (Original)   The method of Claim 9 wherein the step of combining joins two or more request states through a bitwise OR operation.

12.   (Original)   The method of Claim 10 wherein the step of simplifying includes an arbitration operation that follows the requests according to a predetermined priority.

13.   (Original)   The method of Claim 11 wherein the engine requests are grouped in hierarchical levels through the combination and simplification steps.

14-18.   (Cancelled).

19.   (New)   The method defined in Claim 2 wherein the step of evaluating the final request state variable

includes the step of:

transitioning a state machine from an engine off
state to an engine on state in accordance with a predetermined
relationship of engine request variables fpu, pu, ipu and fpd,
which identify an active status or an inactive status of
engine requests.

20.   (New)   The method defined in claim 2 wherein
the step of evaluating the final request state variable
includes the step of transitioning a state machine from an
engine on state to an engine off state in accordance with a
predetermined relationship of engine request variables fpd,
pd, fpu, ipd and pu, which identify an active status or an
inactive status of engine requests.

21.   (New)   The method defined in claim 2 wherein
the step of evaluating the final request variable includes the
steps of:

transitioning a state machine from an engine on
state to an engine off state in accordance with a first
predetermined relationship of engine request variables fpu,
pu, ipu and fpd and otherwise maintaining the state machine in
an engine on state; and

transitioning the state machine from an engine off
state to an engine on state in accordance with a second
predetermined relationship of engine request variables fpu,
pu, ipu and fpd and otherwise maintaining the state machine in
an engine off state, where fpd, pd, fpu, ipd, pu and ipu are
engine request variables, which identify the active or
inactive status of engine requests.

22. (New) The method set forth in claim 20 wherein each fundamental request state comprises a 6 bit binary word, each bit identifying whether an engine request state is active or inactive.

23. (New) The method set forth in claim 21 wherein the step of combining joins two or more request states through a bitwise OR operation.

24. (New) The method set forth in claim 22 wherein the step of simplifying includes an arbitration operation that follows the requests according to a predetermined priority.

25. (New) The method set forth in claim 23 wherein the engine requests are grouped in hierarchical levels through the combination and simplification steps.